# CLAIMS

I claim:

1.  A coil interface for coupling a phased array magnetic resonance imaging coil to a magnetic resonance imaging system, comprising:

    a plurality of signal inputs;

    a plurality of output ports, each of said output ports being associated with a predetermined receiver in the magnetic resonance imaging system; and

    an interface circuit that selectively couples at least two of the signal inputs to at least one of the plurality of input ports.

2.  A coil interface as claimed in claim 1, wherein the interface circuit is remotely configured to couple said plurality of signal inputs to a predetermined sequence of output ports.

3.  A coil interface as claimed in claim 1, wherein said plurality of signal inputs comprises an in-phase MR signal and a quadrature MR signal from a quadrature birdcage coil.

4.  A coil interface as claimed in claim 3, wherein said interface circuit is remotely configured to couple said in-phase MR signal input and said quadrature MR signal input to a single predetermined output port.

5.  A coil interface as claimed in claim 3, wherein said interface circuit is remotely configured to couple said in-phase MR signal input to a first predetermined output port and to couple said quadrature MR signal input to a second predetermined output port.

6.  A coil interface as claimed in claim 1, wherein said plurality of signal inputs exceeds said plurality of output ports.

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7. A coil interface as claimed in claim 1, wherein a conductive path through said interface circuit between an input from the plurality of signal inputs and an output port from the plurality of output ports has an electrical length that is equal to an integer multiple of half wavelengths.

8. A coil interface as claimed in claim 1, wherein said interface circuit comprises a remotely operable PIN diode switch and a 90° phase shift.

9. A coil interface as claimed in claim 8, wherein PIN diode switch is operable from an operator's console for the magnetic resonance imaging system.

10. A method of operating a quadrature phased array MR coil in a plurality of imaging modes, comprising:

    providing an interface circuit that couples the quadrature phased array MR coil to a MRI system having a fixed number of receiver inputs, wherein the quadrature phased array MR coil has a predetermined number of MR signal outputs, the predetermined number of MR signal outputs being greater than the fixed number of receiver inputs;

    selecting an imaging mode from the plurality of imaging modes; and

    configuring the interface circuit to couple at least two of the MR signal outputs to at least one receiver input in accordance with the selection of the imaging mode.

11. A method as claimed in claim 10, further comprising the step of disabling unused coil elements in the quadrature phased array MR coil in accordance with the selection of the imaging mode.

12. A method as claimed in claim 10, wherein the step of configuring the interface circuit comprises adjusting a state of a radio frequency switch.

13. A method as claimed in claim 12, the state of the radio frequency switch causes an in-phase MR signal output from a quadrature element of the quadrature phased array MR coil to be routed to a first receiver input, and causes a quadrature MR signal output from the quadrature element to be routed to a second receiver input.

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14. A method as claimed in claim 12, wherein the state of the radio frequency switch causes an in-phase MR signal output from a quadrature element of the quadrature phased array MR coil to be combined with a quadrature MR signal output from the quadrature element forming a combined MR signal, the combined MR signal being coupled by the interface circuit to a single receiver input.

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15. A method as claimed in claim 14, wherein said single receiver input comprises a FAST receiver input.

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16. A method as claimed in claim 10, wherein the plurality of imaging modes are selected from the set consisting of a neurovascular mode, a high resolution brain mode, and a high speed brain mode.